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# मानक

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IS 12011 (1987): Code of safety practice for domestic LPG installation [MED 23: Domestic and Commercial Gas Burning Appliances]



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*Indian Standard*

CODE OF  
SAFETY PRACTICE FOR  
DOMESTIC LPG INSTALLATION

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## CODE OF SAFETY PRACTICE FOR DOMESTIC LPG INSTALLATION

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# *Indian Standard*

## CODE OF SAFETY PRACTICE FOR DOMESTIC LPG INSTALLATION

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 24 March 1987, after the draft finalized by the Domestic and Commercial Gas Burning Appliances ( Pressure Type ) Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

**0.2** The Liquefied Petroleum Gases ( LPG ) are hydrocarbons in gaseous state at normal atmospheric pressure, and under moderate pressure at normal temperature, are stored, filled and transported as liquid in portable cylinders but used as gas. Thus large volume of gas approximately 246 volumes is stored under pressure in one volume of liquid LPG in cylinder.

**0.3** LPG produced and marketed in India conforms to IS : 4576-1978\* and designated as Commercial Butane/Propane Mixture. LPG is colourless, odourless and being highly inflammable, a malodourant ( foul smell ) is added to detect gas leakage. The gas is twice as heavy as air and can form explosive mixture with air even in very small concentrations. It boils at temperatures below freezing point of ice, thus at normal temperatures are exerting internal pressure, which is several times that of atmospheric. Although cylinders are designed and tested for the requisite internal pressure, at excessive temperatures the gas in cylinder can attain internal pressure which can result in its failure to stand such pressure. LP Gases in liquid form have a tendency for very large expansion in volume. It expands almost 10 times as much as water and 100 times that of steel. Thus, liquid LPG is never filled in cylinder up to brim but an ullage or space for gas is left above liquid.

**0.3.1** In view of the above and other safety related properties some simple rules/code need be observed for its safe operation/installation. Because the rules are simple, they are neglected. Failure to observe these rules may lead to accidents of varying intensity. This code assumes

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\*Specification for liquefied petroleum gases ( *first revision* ).

particular relevance to Indian conditions where the use of LPG in individual household has been widely expanding and protection of consumers from the hazards arising during installation and operation is of vital interest.

**0.4** While preparing this standard, it is presumed that only standardized and approved equipment and appliances are used in the LPG installation. The distribution equipment that is cylinder, valve and pressure regulator, are the property of oil companies loaned to the consumer against refundable deposit. The maintenance of the same is the responsibility of oil companies. Do not tamper with the equipment.

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## **1. SCOPE**

**1.1** This standard covers general safety requirements to be observed during installation and operation of domestic appliances using LPG in cylinders as fuel.

## **2. GENERAL**

**2.1** The term Domestic shall mean Individual Household and Installation shall mean to consist of the following:

- a) A cylinder conforming to IS : 3196-1982\* fitted with a spring actuated self closing valve conforming to IS : 8737 ( Part 2 )-1978† and approved by the Chief Controller of Explosives for India.
- b) A pressure regulator of appropriate type matching the cylinder valve and conforming to IS : 9798-1981‡.
- c) LPG resistant flexible tubing conforming to IS : 10908-1984§ or any other approved type metallic shielded/braided tubing.
- d) An appliance such as LPG stove conforming to IS : 4246-1984|| and/or cooking range conforming to IS : 4760-1979¶ and/or grillers conforming to IS : 11480-1985\*\* or any other approved appliance for domestic use.

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\*Specification for welded low carbon steel gas cylinder exceeding 5-litre water capacity for low pressure liquefiable gases ( *third revision* ).

†Specification for valve fittings for use with liquefied petroleum gas ( LPG ) cylinders of more than 5 litre capacity: Part 2 Valve fittings for newly manufactured LPG cylinders.

‡Specification for low pressure regulators for use with liquefied petroleum gas ( LPG ) mixtures.

§Specification for flexible rubber tubing for liquefied petroleum gas.

||Specification for domestic gas stoves for use with liquefied petroleum gases ( *third revision* ).

¶Specification for domestic cooking ranges including grillers, for use with liquefied petroleum gases ( *first revision* ).

\*\*Specification for domestic grillers for use with liquefied petroleum gases.



### **3. INSTALLATION**

#### **3.1 Place of Installation**

**3.1.1** The kitchen or room where the appliance is installed shall be well ventilated so that leakage of gas, if any, during faulty lighting or extinguishing of flame is swept away by natural draft.

**3.1.2** The kitchen or room shall have at least one window and one door open to the atmosphere.

**3.1.3** The kitchen door shall have a minimum gap of 3 mm under door shutter at floor level.

**3.1.4** The door opening of the kitchen shall not be near the lift shaft or entry/exit to basement.

#### **3.2 Installation of Appliance**

**3.2.1** The appliance shall preferably be installed on the platform approximately 75 cm high facing the wall from the floor level.

**3.2.2** The leakage shall not be checked with naked fire or lighted match stick.

**3.2.3** Appliance with open flames shall not be placed directly in front of window facing a strong breeze, disturbing/blowing off or extinguishing the flame.

**3.2.4** Cabinets, shelves or such other mountings on wall behind the appliance shall be totally avoided (lest loose clothing such as sarees may come in contact with flames while removing the contents from wall mountings).

**3.2.5** In absence of cooking platform, or in an unavoidable situation where the appliance and cylinder are both installed at same level, an approved/appropriate 'Extension Piece' of metal shall be used on appliance inlet connection for connecting the flexible tubing.

**3.2.6** Ensure that the inlet nozzle to the appliance is on the same side at which the cylinder is kept.

#### **3.3 Installation of Cylinder**

**3.3.1** The gas cylinder shall always be installed in an upright/vertical position and at floor level. Under no circumstances, it shall be placed horizontally.

**3.3.2** If cylinder is installed in a position other than vertical, in the event of leak, liquid LPG will leak which is highly hazardous than leakage of gas.

**3.3.3** Do not use stands for cylinder. Cylinders must always be kept on its 'foot ring' welded at the bottom.

**3.3.4** The installed cylinder shall be easily accessible and shall not be placed in closed enclosure. The place of location shall be such that leaked gas, if any, shall be swept by natural draft.

**3.3.5** The cylinder shall be so installed that the gas tubing shall not get disturbed due to movement of operator during use.

**3.3.6** Gas cylinder shall not be placed near any source of heat, such as kerosene stove, open fire chullas, heaters, boilers or any potential sources of heat.

**3.3.7** The LPG installation shall not be provided on a loft.

**3.3.8** The LPG installation shall not be provided in a basement where the floor level is below the adjoining ground level. Only if effective artificial floor level ventilation is provided, the installation could be in such a basement.

**3.3.9** Whenever empty gas cylinder is replaced with filled one (refill), ensure that the cylinder valve outlet carried a proper and undamaged rubber gasket. Absence of such a gasket will result in hazardous gas leakage.

**3.3.10** After installing new connection or replacing the empty gas cylinder the joint between the rubber tube and pressure regulator nozzle and that between rubber tube and appliance nozzle shall be checked with soap solution against the leakage.

**3.3.11** The leakage shall not be checked with naked fire or lighted match stick.

**3.3.12** Do not change the colour of cylinder. As per international code, the 'Signal Red' colour identifies that the cylinder contains LP gas.

**3.3.13** No flammable or combustible material should be stored in the immediate vicinity of the cylinder or in the same room in which it is kept.

**3.3.14** No oil or similar lubricant should be used on the valves or other fittings of the cylinder.

**3.3.15** Look for the next due date of re-testing of the cylinder. This is indicated at the back of one of the 4 vertical supports for handle ring. If this date is over, 'Do Not' accept the cylinder.

**3.3.16** Cylinders shall not be installed under conditions which will cause them to corrode.

**3.3.17** Cylinders are filled by weight. An overfilled cylinder is a potential safety hazard. Do not accept such cylinder.

#### 4. GAS TUBING

**4.1** The flexible tube used for the installation shall conform to IS : 10908-1984\* or any other approved type metallic shielded/braided tubing.

**4.2** The tubing shall be regularly checked for its condition especially the ends which can develop cracks while in service. It is necessary to replace tubing immediately if found to develop defects and recommended to replace after its maximum service of two years.

**4.3** The tubing shall preferably be secured to the nozzles both for appliance as well as pressure regulator with the help of either hose-clip or any other appropriate fastener or provision.

**4.4** Rubber tubing shall be cut with a sharp blade so as to get a clean end face. The end of the tubing be slipped on to the nozzle to cover the entire length of the nozzle.

**4.5** The tubing end may be moistened with water while slipping the tubing on to the nozzle. Oil/grease/lubricant/soap solution shall not be used for slipping the tubing.

**4.6** The tubing shall not have crimps or sharp kinks. It shall not unnecessarily be too long nor too short. The maximum recommended length of the tubing is 1.5 metres.

**4.7** Tubing for domestic installation has been standardized for two sizes of bore that is 6.4 mm bore and 7.0 mm bore. Select the correct bore depending on the size of the nozzle on appliance as well as on pressure regulator ( *see also 5.2* ).

#### 5. APPLIANCE

**5.1** Certification of the appliance by BIS/respective Oil Company shall be the guiding factor for its quality and safety-worthiness. In case of imported appliance manufactured to known international specifications approval for use shall be verified in consultation with Oil Company.

**5.2** Prior to connecting the appliance, it shall be ensured that its inlet nozzle has the same size ( outer diameter ) as that of the nozzle on pressure regulator. This is essential so that rubber tubing fits tightly at both the ends ( *see also 4.7* ).

**5.3** The burners for LPG stoves and cooking range top burners are designed and approved to give greenish blue stable flames in full on and simmer position of gas taps. In case this is not obtained, the appliance needs to be checked/attended by a trained mechanic of the LP gas distributor.

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\*Specification for flexible rubber tubing for liquefied petroleum gas.

## **6. INSTRUCTIONS FOR USE**

**6.1** The consumers shall be guided by the operating instructions as provided by the manufacturers with the appliance. In addition the following safe practice shall also be ensured:

- a) Before operating the pressure regulator knob to 'gas flow' position, ensure that the appliance taps are in 'OFF' position.
- b) For lighting the appliance, bring the lighted match stick very near to the burner ports ( head ) and then open gas cock of the appliance to full 'ON' position so as to avoid escape of unburnt gas.
- c) In case of delay/failure in lighting the burners, resulting in escape of unburnt gas, close the appliance taps and wait till the mal-odourant/foul smell indicating presence of leaked gas disappears. Light the burners again following earlier instructions for lighting. This would avoid a situation of any minor fire or explosion.
- d) The burner shall not be lighted in 'Simmer' position of appliance taps.
- e) The burners shall not be lighted with vessels on it.
- f) When the appliance is not in use, close the appliance taps and turn the regulator knob to 'gas off' position before leaving the place.

## **7. CHANGING OF CYLINDER**

**7.1** The consumers shall ensure to follow the 'Customer Instruction Card' provided by Oil Companies through their LP Gas distributor while releasing/installing a new connection.

**7.2** Put out all the flames or sources of fire in the kitchen. Avoid putting on/off any electric appliance. Keep the door/window open.

## **8. RESERVE CYLINDER ( UNCONNECTED )**

**8.1** On receipt of filled cylinder, remove the seal and the 'Safety Cap' provided on valve outlet.

**8.2** Ensure that the valve outlet is provided with rubber gasket.

**8.3** Press in the 'Safety Cap' on valve outlet. This is necessary to ensure that the gas will not leak out from an unconnected cylinder with leaky valve pin. This also prevents ingress of foreign matter in valve outlet which can render valve leaky when in use.

## 9. TO HANDLE LEAKAGE

**9.1** If you smell gas, follow the following procedure to prevent fire hazards:

- a) Shut the burner taps and pressure regulator knob, to 'OFF' position.
- b) Open the door and windows for free ventilation.
- c) Extinguish all flames. Do not switch 'ON' or 'OFF' any electrical equipment to avoid any electric spark or such other sources of fire/ignition.
- d) Light the burners only after the smell disappears.
- e) In case of persistent/heavy leakage, detach the pressure regulator from the cylinder valve, fit the 'Safety Cap' on the valve outlet and remove the cylinder ( without tilting it ) to balcony or open space where it is least dangerous to life and property and away from any source of ignition. Keep away to avoid starvation of Oxygen due to breathing the gas concentrated air.
- f) Call your LP Gas distributor or emergency cell of oil companies for handling the emergency.

## 10. CLEANING THE APPLIANCE

**10.1** The consumers shall be guided by the instructions as provided by the manufacturers with the appliance. If necessary, in addition the following practice is recommended for cleaning of the appliance:

- a) Close the appliance taps and pressure regulator knob to 'OFF' position and wait till the surface of the appliance is cooled. If you attempt to clean hot surface with wet cloth, the surface finish may crack.
- b) First clean the surface of appliance with dry cloth. Then clean it with a moist cloth to remove stains from spilled cooking.
- c) To clean the burner head and mixing tube, remove it and dip it in warm solution of soap in water and clean the burner ports with 'tooth prick' or a soft metal ( copper or aluminium ) wire. Clean it with plain water and then clean the mixing tube internally with a stiff bottle brush. Wipe it dry to prevent rusting.
- d) Do not tamper with the gas jet/orifice nor attempt to clean it with steel pin.
- e) Never soak the appliance body in water as the grease/lubricant in the gas tap may be washed away resulting in the possibility of leakage of gas.

## **11. ACCIDENTS AND ENQUIRIES**

**11.1** Statutory regulations demand that notice of accident(s), involving LPG installation be given forthwith:

- a) to the Chief Controller of Explosives for India by Express Telegram ( Telegraphic Address — EXPLOSIVES, NAGPUR ) followed by a letter giving particulars of the occurrence within 24 hours; and
- b) to the Officer-in-Charge of the nearest Police Station by the quickest route.

This would normally be complied with by the concerned LPG Distributor and/or Oil Company, after proper enquiry and investigating the circumstances leading to accident.

For these reasons and also for legalities involved in insurance claims, it is recommended that in any room the LP Gas equipment installed shall only be from one Oil Company.